WILLIAM H. DORRANCE

Land Defenses of O'ahu's Forts, 1908–1920

FEW ENTERPRISES HAVE LEFT more monuments on O'ahu than did the Army's Coast Artillery Corps. When the Army inactivated the Corps in 1950, O'ahu was left with numerous concrete structures scattered about reservations known as Forts Ruger, DeRussy, Armstrong, Kamehameha, Weaver, Barrette, and Hase, along with observation posts and remnants of gun and searchlight emplacements in the heights of the Wai'anae and Ko'olau mountain ranges. The names of the forts survive and numerous of the concrete structures attract the attention of the inquisitive. This is the history of how some of the more unusual of these artifacts came to be.

High-powered, rifled naval guns rendered masonry harbor-defense forts impotent during the Civil War. The Army saw dire implications in the ease with which Fort Pulaski, at the mouth of the Savannah River, was reduced by rifled cannon. Harbor-defense forts consisting of tier on tier of smooth-bore cannon emplaced within brick casemates[1] were clearly obsolete.

Nevertheless, the nation grew complacent following the end of the Civil War and little was done to strengthen seacoast fortifications until President Grover Cleveland took office in 1885. Congress was determined to upgrade seacoast defenses because of a perceived threat of European maritime powers. Following a congressional act making appropriations for fortifications, President Cleveland directed Secre-

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tary of War William C. Endicott to convene a board to "examine and report at what ports fortifications or other defenses are most urgently required, the character and kind of defenses best adapted for each. . . ."[2]

The Endicott Board's report was submitted to Congress in January 1886. Construction of more than seventy upgraded harbor-defense forts followed in the next twenty-eight years. The new harbor defenses would consist of dispersed batteries of large-caliber mortars,[3] large-caliber guns, most of which were mounted on disappearing carriages,[4] and fields of submarine mines "planted" in harbor mouths by the Army in times of threat. Small-caliber, rapid-fire guns would protect the mine fields from intruders.

It was a lethal combination. The lofted mortar projectiles threatened the armored decks of the naval vessels of the day. The large-caliber guns threatened the armored sides, and the submarine mines put the lightly armored bottoms at risk. No admiral would attempt to run into, or anchor in the vicinity of, any harbor so defended.

Following the Spanish-American War of 1898, Puerto Rico, the Philippines, and the Hawaiian Islands became possessions of the United States. When President Theodore Roosevelt took office, he saw that scientific advances made possible improvements in Endicott Board-inspired harbor defenses, and that suitable defenses were required for harbors located within the "insular possessions." In January 1905 he instructed Secretary of War William H. Taft to convene the National Coast Defense Board (Taft Board) "to consider and report upon the coast defenses of the United States and the insular possessions."[5]

The Taft Board report was submitted by President Roosevelt to the Congress in March 1906. The board recommended that O'ahu's defenses consist of fortifications that defended Honolulu Harbor and Pearl Harbor. The recommendations were refined by a joint Army and Navy board in 1908, and the harbor defense buildup on O'ahu followed the refinements until the onset of World War I.[6]

In 1908 the U.S. Army Corps of Engineers was in the midst of constructing O'ahu fortifications in accordance with the recommendations of the joint board. Plans called for the emplacement of a battery of 3-inch guns to protect a submarine mine field that, in times of war, would be planted in the entrance to Honolulu Harbor; a battery of eight 12-inch mortars to protect each harbor; batteries of two 6-inch

disappearing rifles and two 14-inch disappearing rifles to protect Honolulu Harbor; and a battery of two 12-inch disappearing rifles to protect Pearl Harbor.

These weapons were to be emplaced within military reservations that were eventually named Forts Armstrong, Kamehameha, DeRussy, and Ruger. The origins of these names are shown in Table 1. Forts were named for deceased persons who had rendered service to the U.S. government or had otherwise distinguished themselves, and gun batteries were named for deceased Army officers who had rendered distinguished service. The allocation, battery names, and construction commencement dates of the pre-1910 emplacements are given in Table 2.

The forts and battery emplacements were constructed according to the concepts of the times.[7] The batteries were dispersed for concealment and to insure that a projectile striking one would not thereby endanger a neighbor. They were open to the rear to facilitate ammunition service at a rapid rate.

The mortars were emplaced four to a pit and were secure when exposed to the flat naval fire of the time. The 6-inch, 12-inch, and 14-inch guns were mounted on disappearing carriages that remained concealed behind a frontal parapet until elevated to fire.

When the Endicott Board submitted its report in 1886 the nation was confident that no enemy would attempt to land a force at locations other than at developed seaports with their convenient disembarking wharves. It was believed that the standing Regular Army and a large militia, much of it composed of blooded Civil War veterans, would meet and defeat any enemy attempting to land elsewhere. Land defense of the new fortifications received scant attention until a War College study of 1905–1906 pointed to the vulnerability of the forts to attacks from the rear.[8]

During the Spanish-American War, sixteen regiments were found necessary to defend the east coast of the United States alone.[9] From this, it was clear that the nation's land army was inadequate to the task when both coasts were threatened. An enemy could land a force at a location of its choosing and take harbor-defense forts from the rear. Once the forts were taken, the enemy vessels could use the harbors as disembarkation points with impunity, and the main purpose of the harbor-defense forts would be defeated.

TABLE 1
ORIGIN OF NAMES OF O'AHU
PRE-WORLD WAR II FORTS AND BATTERIES

FORT/BATTERY	NAMED FOR	YEAR OF DEATH	GENERAL ORDER NO.; YEAR
Ruger/	Maj. Gen. Thomas E.	1907	15; 1909
Birkhimer	Brig. Gen. William E.	1914	15; 1916
Harlow	Maj. Frank S.	1906	15; 1909
Hulings	Col. Thomas M.	1864	36; 1915
Dodge	Maj. Theodore A.	1909	36; 1915
Mills	Col. Stephen C.	1914	36; 1915
DeRussy/	Bvt. Brig. Gen. Rene Edward	1907	15; 1909
Randolph	Maj. Benjamin H.	1907	15; 1909
Dudley	Brig. Gen. Edgar S.	1911	59; 1911
Armstrong/	Brvt. Brig. Gen. Samuel C.	1892	160; 1909
Tiernon	Brig. Gen. John L.	1910	59; 1911
Kamehameha/	Kamehameha I	1819	245; 1909
Hasbrouck	Brig. Gen. Henry C.	1910	59; 1911
Selfridge	1st Lt. Thomas C.	1908	15; 1909
Jackson	Brig. Gen. Richard Henry	1892	72; 1913
Barri	Capt. Thomas O.	1863	36; 1915
Chandler	2d Lt. Rex	1913	36; 1915
Adair	1st Lt. Henry R.	1916	13; 1917
Boyd	Capt. Charles T.	1916	13; 1917
Closson	Brig. Gen. Henry W.	1917	13; 1922
Weaver/	Brig. Gen. Erasmus M.	1920	13; 1922
Williston	Brig. Gen. Edward R.	1920	13; 1922
Barrette/	Brig. Gen. John D.	1934	10; 1934
Hatch	Brig. Gen. Henry J.	1931	10; 1934

Note: This list of the origins of the names of the forts and batteries was compiled by Alvin H. Grobmeier from the Army Headquarters listing of General Orders and from various listings in the Official Army Register.

TABLE 2
HARBOR DEFENSE FORTS AND BATTERIES
(BATTERIES COMMENCED BEFORE 1910 FISCAL YEAR)

FORT	BATTERY	NUMBER OF CANNON	CALIBER	COMMENCEMENT DATE[a]
Ruger	Harlow	eight mortars	12-inch	April 1907
Kamehameha	Selfridge	two	12-inch	November 1907
	Hasbrouck	eight mortars	12-inch	July 1909
DeRussy	Randolph	two	14-inch	December 1908
	Dudley	two	6-inch	July 1909
Armstrong	Tiernon	two	3-inch	April 1909

[a]The Corps of Engineers published a "Report of Completed Works" upon completion of each battery. The commencement dates used here were taken from the form 1 for each battery. These forms are found in National Archives Record Group 77 (Records of the Office of the Chief of Engineers). Forts Weaver, Barrette, and Hase and several batteries were constructed after 1910.

It didn't help that the emplacements of the largest caliber guns limited their traverse to 170 degrees.[10] This resulted because the protective parapets were so close to the gun mounts that when the guns were pointed to the rear there would be insufficient room to accommodate the recoil when the guns were fired. The gun mounts and emplacements were designed to protect the guns from frontal naval fire at a sacrifice of a 360-degree field of fire.

Following the War College study of 1905–1906, the acting chief of artillery, Lieutenant Colonel Arthur Murray,[11] recommended that a group of officers be detailed to study the problem of "protection of seacoast forts from attack by land." War Department Special Order No. 64, March 18, 1907, followed Colonel Murray's recommendations. What was later named the National Land Defense Board consisted of four officers, including Captain William G. Haan.[12]

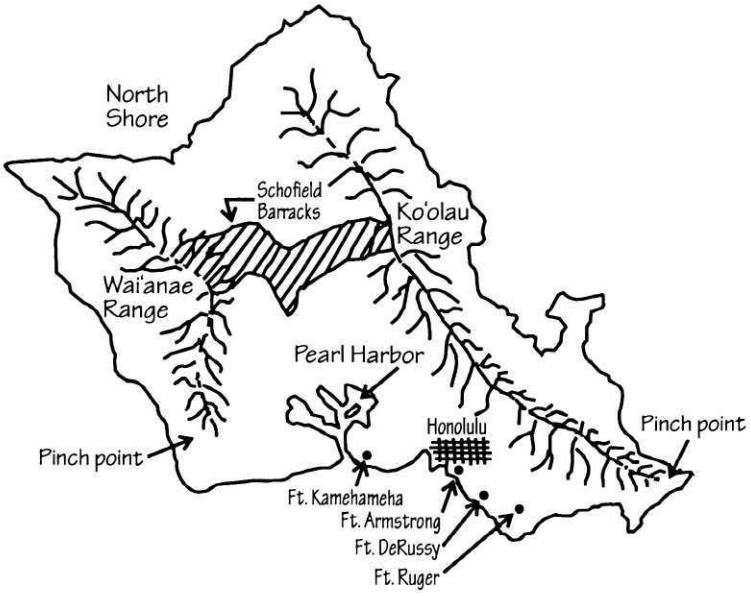

FIG. 1. Location of harbor-defense forts and pinch points cited by Major William G. Haan in his May 15, 1908, report to the National Land Defense Board. (W. H. Dorrance.)

In 1908 newly promoted Major Haan visited O'ahu to carry out the board's assignment.[13] The Army was in the midst of fortifying the approaches to Honolulu Harbor and Pearl Harbor, and it was Haan's assignment to identify the proper land defenses to protect the fortifications.

As Haan observed, O'ahu's situation was unique. A large segment of the population was Japanese, thought to be a domestic problem should future hostilities involve Japan as an enemy.[14] He concluded that at least one infantry regiment must be permanently garrisoned on the island to deal with attacks by the local population and additional regiments were required to oppose landings on the north shore or elsewhere.[15]

Haan's recommendations that defenses against hostile landings on the relatively open north shore and the eastern and western flanks of the island be vested in a garrison of infantry eventually resulted in the location of an army division at Schofield Barracks.

Further, Haan's recommendation that landings on the mountain-

ous east or west coasts be sealed off at narrow shoreline pinch points rather than being met with fixed fortifications along these coasts was also accepted. He also recommended that an ordnance depot be established and the island be carefully mapped to a fine scale. The War Department sent Haan's report to the War College Division for review.[16]

Several reviews and iterations of land defense plans for O'ahu ensued. In 1910 Brigadier General Murray, chief of Coast Artillery, objected to Haan's plan as promulgated by the War Department. He had visited O'ahu in 1909 and concluded that the enemy should be kept off the island at all costs no matter where he chose to land.

Murray proposed to accomplish this by installing an additional five to seven mortar batteries of four 12-inch mortars each at suitable intervals around the island. General Murray also urged that the Navy Department's cooperation be sought to determine where along the coastline such landings might be attempted.[17]

The War Department and Navy Department conducted a joint survey of the island in 1911.[18] Commander-in-Chief of the Pacific Fleet Admiral Chauncey Thomas; the commanding general of the California Department, now Major General Murray; and the commanding general of the Honolulu District, Brigadier General Montgomery M. Macomb,[19] conducted around-the-island inspections, first by boat and then by automobile.

General Murray won Admiral Thomas over to his view of the situation, and Thomas endorsed the idea of installing seven new 12-inch mortar batteries around the island.[20]

The War Department faced a dilemma. On the one hand, Major Haan's report had been reviewed by a War College committee and endorsed by the chief of staff. On the other hand, respected senior officers, General Murray and Admiral Thomas, disagreed with Haan's report and urged that seven new mortar batteries be distributed around the O'ahu coastline to keep the enemy off the island.

On January 31, 1912, the War College recommended to the chief of staff that "a study of the military problem of Oahu" be performed to resolve the question of land defenses once and for all.[21] The secretary of war concurred, and the Board to Study and Report upon the Defenses of Oahu (Macomb Board) was appointed shortly thereafter.

The Macomb Board convened in Honolulu on July 12, 1912, and

was chaired by General Macomb. The board made its report to the War Department on September 6, 1912, and subsequent appropriations requests reflected the board's recommendations.

The seven mortar batteries proposed by Murray and Thomas were not included in the board's recommendations, and Major Haan's assertion that landings on the eastern and western shores should be sealed off at "pinch points" was seconded.

In 1912 the Army was in a poor position to cover O'ahu's pinch points with mobile artillery because of a shortage of appropriate artillery pieces. The Army's Watervliet Arsenal gun factory had concentrated on fabrication of large-caliber coastal-defense cannon to the detriment of producing the mobile howitzers and guns that land-defense forces would require. By the end of 1914, for example, the Army's thirty-six four-gun batteries of field artillery possessed no more than eighty-eight mobile 4.7-inch guns and howitzers.[22] It could be expected that the land defenses would be built around the use of stationary gun emplacements because it was the only option available at the time.

The Army Ordnance Department improvised as best it could. Some 4.7-inch and 6-inch guns resulting from orders placed with the English W. G. Armstrong works during the Spanish-American War were removed from their seacoast defense emplacements and sent to O'ahu. Also, there were two 5-inch guns available that came from an inactivated Delaware River battery.[23] These guns were to be emplaced in casemated works at locations selected by the Macomb Board and its following review board. In addition, the Ordnance Department developed a high-explosive projectile for the 12-inch mortars, a few of which were available for land defense.[24] Until then, all projectiles supplied for the seacoast mortars were thick-skinned deck-piercing rounds not conducive to producing shrapnel.

Six rapid-firing six-pounder guns were made available (later increased to twelve).

O'ahu's land-defense emplacements were to be unique. Two 4.7-inch gun batteries were to be tunneled into the rim of Diamond Head crater positioned to sweep the beaches north of Diamond Head. The six rapid-fire 6-pounder guns were emplaced on the crater's rim pointed in the same direction. Two batteries were to be

FIG. 2. Northeast tip of Ford Island circa 1917 showing two armed casemates of Battery Adair. The narrow-gauge railroad pier was used to load the sugarcane harvests onto barges that transported the cane to a railhead on Waipio Peninsula. (National Archives NA 38–FCD–35.)

emplaced on Ford Island, one at the northern edge and the other on the western side of the island. These batteries would protect Fort Kamehameha. Other batteries were to sweep the Ewa plain and cover the Waipio Peninsula. A mortar battery was to be constructed inside Diamond Head crater and with the 360-degree traverse of the mortars would keep a radius of nine miles within their field of fire. Except for the mortar battery, all batteries were to be casemated with reinforced concrete and a cover of earth.

The gun emplacements were supplemented with six strategically placed searchlights, a redoubt on Red Hill anchoring the north end of the western line, and certain ditches.

Except for 3-inch gun Battery Edwards at Fort Mott, the new batteries would be the first casemated batteries constructed by the engineers in the post–Civil War era. Colonel Edward Burr, assistant to the chief engineer,[25] explained: "This armament is of the coast defense type and for land defense purposes it requires emplacements designed

TABLE 3
O'AHU LAND DEFENSES, 1914–1920 ERA

BATTERY	LOCATION	CONSTRUCTION STARTED	ARMAMENT	FIELD OF FIRE
Mills	Black Point	Aug. 1914	two 5-inch	Wai'alae District
Barri	Bishop's Point	Sept. 1914	two 4.7-inch	Ewa Beach
Chandler	Bishop's Point	Sept. 1914	two 3-inch	Waipio Peninsula
Hulings	Diamond Head	Sept. 1914	two 4.7-inch	North to Koko Head
Dodge	Diamond Head	Sept. 1914	two 4.7-inch	North to Koko Head
Birkhimer	Diamond Head	June 1915	four mortars	360 degrees
Adair	N.E. Ford Is.	Aug. 1916	two 6-inch	Pualoa Plain
Boyd	W. Ford Is.	Aug. 1916	two 6-inch	Ewa Plain

to furnish protection from overhead and flank fire such is not contemplated in coast defense design. . . ."[26]

The emplacements listed in Table 3 were approved and appropriations made for them by the Congress.

When the fields of fire for these batteries are overlaid on a map of southern O'ahu it is clear that the fields overlap and Major Haan's "pinch points" are covered. A protected citadel encompassing the anchorage and naval base at Pearl Harbor, metropolitan Honolulu, and all coastal defense forts was created. Attacks from the ocean would be met by the harbor-defense cannon.

These improvisations were doomed to be short-lived because of fast-moving events elsewhere. Long before the United States entered World War I in April 1917, the British Navy had met and defeated the

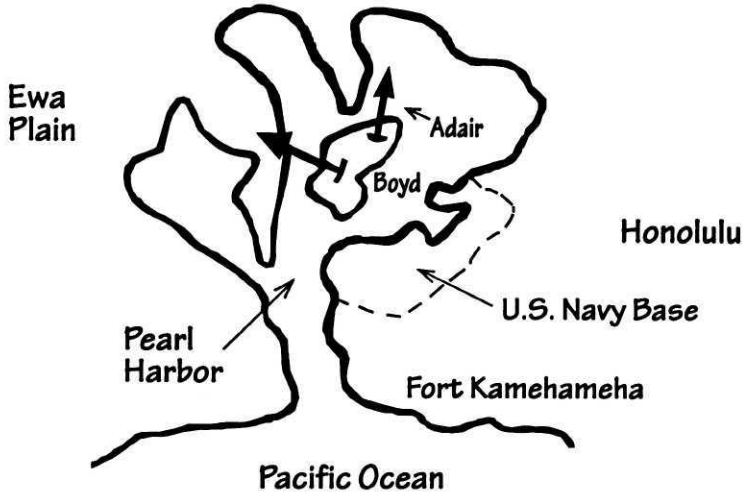

FIG. 3. Location of Batteries Boyd and Adair on Ford Island showing relation of gun directrixes to the naval base, Honolulu city, and Fort Kamehameha. The island was leased to the Oahu Sugar Company and planted in sugarcane through 1918. (W. H. Dorrance.)

Imperial German Navy in epic battles near the Falkland Islands and at Dogger's Bank in the North Sea.[27]

Long-range fire using elevated large-caliber guns carried the day in these battles. From this it became clear that the concept of the disappearing gun carriage was obsolete because it limited gun elevation angles to twenty degrees or less. Long-range fire requires elevation angles much higher than that possible with disappearing carriages with their complicated linkages.

Further, the enemy's long-range projectiles would descend at an angle such as to render the protecting frontal parapet useless. The day of the disappearing gun emplacements had passed, and the nation's harbor defenses were again obsolete.

Responding to the concerns of Congress about this development, on March 10, 1915, Secretary of War Lindley M. Garrison convened the Board of Review to study and recommend "as to the need of seacoast defenses" in the wake of overseas developments. The board made its report on November 26, 1915, with far-reaching consequences. According to the board, the new weapons should include 12-inch and 16-inch guns capable of high-angle fire and antiaircraft

guns to meet the new threat of airplanes. Explicit recommendations for O'ahu included:

> six 12-inch guns mounted for long range fire—to cover water areas not covered by existing armament from which the naval utilities [i.e., the base at Pearl Harbor] can be bombarded by a hostile naval force, and *to afford a means of defense against hostile warships attempting to support landings on the island.*[28] (emphasis added)

Fortunately, the Ordnance Department had developed a barbette carriage for the 12-inch gun that made possible high gun elevations and 360-degree traverse. With a new 975-pound projectile and an elevation angle of thirty-five degrees, the 12-inch gun had a maximum range of 30,100 yards (17 miles).

In 1920 two of the 12-inch guns were emplaced in the Fort Kamehameha reservation and subsequently named Battery Closson. When this battery was emplaced, the earlier land-defense guns were outreached and rendered obsolete. The 360-degree traverse capability allowed Battery Closson's guns to discharge both harbor-defense and land-defense missions. The curious episode of employing casemated seacoast defense cannon as land-defense batteries was coming to an end.

By 1925 the fixed land-defense batteries were disarmed or assigned other functions. The 4.7-inch guns were removed from Batteries Barri, Hulings, and Dodge. Battery Birkhimer (four 12-inch mortars) was found to be too cramped and poorly designed. The battery was extensively rebuilt and subsequently listed as a harbor-defense battery.

Batteries Mills, Adair, and Boyd were disarmed. Battery Chandler's 3-inch guns were designated as spares for Batteries Tiernan at Fort Armstrong and Hawkins at Fort Kamehameha.

Nothing remains today of Batteries Mills, Barri, and Chandler. Batteries Hulings and Dodge are sealed off but remain intact, without guns, tunneled into the rim of Diamond Head Crater. The two 4.7-inch Armstrong guns of Battery Dodge are mounted on concrete pedestals in front of the Hawaii National Guard Armory located in Wahiawa at the south border of Wheeler Field. The original pit of Battery Birkhimer has been covered over and serves as the headquar-

FIG. 4. A 12-inch gun of Battery Closson. Two of these guns were emplaced in 1920 within the Fort Kamehameha reservation. Full-caliber practice firings of all seacoast batteries were limited to once a year to conserve ammunition and limit disturbance of the surrounding communities. (15th Air Base Wing Historian's Office)

ters for the State of Hawai'i's Department of Defense, Office of Civil Defense.

Batteries Adair and Boyd survive without guns. Battery Boyd is used for storage by the Navy, and Battery Adair is incorporated in the foundation of a flag officer's residence.

NOTES

[1] A casemate is a bombproof chamber in a fort in which cannon are mounted to be fired through openings facing the enemy, called embrasures.

[2] U.S. House of Representatives, *Report of the Board of Fortifications Appointed Under the Provisions of the Act of Congress Approved March 3, 1885*, Executive Document 49, 49th Cong., 1st Sess., Serial 2395, "Endicott Board Report" 5.

[3] The Army divides cannon into three categories: mortars, howitzers, and guns. A mortar has a short barrel and is fired on a steeply elevated trajectory. Its projectile descends almost vertically. A howitzer has a longer barrel and is fired on

a less elevated trajectory but elevated enough that it can reach targets hidden from flat-trajectory guns. A gun has the longest barrel and, except for antiaircraft work, is fired on a relatively flat trajectory.

[4] The disappearing gun carriages employed a heavy counterweight to raise the guns to firing position. When the gun was fired, the recoil of the gun caused it to pivot backwards and down to the loading position. Latches held the guns in the recoiled position for loading.

[5] U.S. Senate, *Coast Defenses of the United States and the Insular Possessions,* Senate Document 249, 59th Cong., 1st Sess., 6 Mar. 1906, "Taft Board Report" 5. See also William H. Dorrance, *Fort Kamehameha: The Story of the Harbor Defenses of Pearl Harbor* (Shippensburg, Pa.: White Mane Publishing Co., 1993).

[6] Major Arthur S. Conklin, *Historical Sketch of the Defenses of Oahu by the United States* (rpt. Honolulu: U.S. Army, March 1913) 6, 7.

[7] Col. Eben Eveleth Winslow, *Notes on Seacoast Fortification Construction.* Occasional Papers, no. 61, U.S. Army Engineer School (rpt. Washington: Government Printing Office, 1920).

[8] Lt. Col. William G. Haan, "What Has Been Done Since 1892 For The Defense of Our Coast Line Outside The Coast Forts," *Journal of the United States Artillery* 39.2 (March–April 1913): 132, 133.

[9] Haan, "What Has Been Done" 131.

[10] War Department, *Instructions for Mounting, Using and Caring for Disappearing Carriages for 14-Inch Guns.* Ordnance Department Report 1712 (rpt. Washington: Government Printing Office, 1917) 7 and drawing no. 11–5–1.

[11] Arthur Murray graduated from the U.S. Military Academy at West Point with the class of 1874 ranked second. He served as chief of artillery, then chief of coast artillery (1907) from 1906 to 1911. He commanded the Western Department of the Army from 1911 to 1915 and, recalled from retirement, from 1917 to 1918. He received the Distinguished Service Medal for his last assignment. He permanently retired in 1918 and died at Washington, D.C., 12 May 1925 at the age of seventy-four. Bvt. Major General George W. Cullum, *Biographical Register of the Officers and Graduates of the U.S. Military Academy at West Point* (New York: Seemans & Peters, Printers, Saginaw, Michigan) vol. VIA, 189; vol. VII, 120.

[12] William G. Haan graduated from the U.S. Military Academy at West Point with the class of 1889 ranked twelfth. After serving at numerous coast artillery commands, during World War I he commanded the Thirty-Second Division of the American Expeditionary Force, for which he was awarded the Distinguished Service Medal. Major General Haan retired 31 Mar. 1922 and died at Washington, D.C., 26 Oct. 1924 at the age of sixty-one. Cullum, *Biographical Register* vol. VIA, 514–15; vol. VII, 283.

[13] Conklin, *Historical Sketch* 8–11.

[14] In 1908, during Major Haan's visit, there were seven major sugar plantations on O'ahu. A June 1901 compilation listed 6,364 Japanese sugar workers on O'ahu of a total population of 58,504. An 1896 census gave a total of 109,020 residents in Hawai'i of whom 22,329 were Japanese. *HAA* 1902: 38, 39.

[15] Conklin, *Historical Sketch* 9, 10.

[16] Conklin, *Historical Sketch* 11, 12.

[17] Conklin, *Historical Sketch* 13–16.

[18] Conklin, *Historical Sketch* 20–23.

[19] Montgomery M. Macomb graduated from the U.S. Military Academy at West Point with the class of 1874 ranked fourth. Between January 1911 and March 1914 he commanded, successively, the Department of Hawai'i, the Hawai'i Department, and the First Hawaiian Brigade. Following his Hawai'i duty, he served as president of the Army War College in Washington before retirement as a brigadier general in October 1916. Macomb died at New York on 19 Jan. 1924 at the age of seventy-seven. Cullum, *Biographical Register,* vol. VIA, 189–90; vol. VII, 120.

[20] Conklin, *Historical Sketch* 20–22.

[21] Conklin, *Historical Sketch* 30.

[22] U.S. Army Center of Military History, *Order of Battle of the United States Land Forces in the World War* (Washington: U.S. Army Center of Military History, 1988), vol. 3, pt. 1, 202. See also Watervliet Arsenal, *A History of Watervliet Arsenal 1813 to Modernization 1982* (rpt. Watervliet, N.Y.: U.S. Army Watervliet Arsenal, 1982) 96.

[23] Capt. Douglas MacArthur, Memorandum for the chief of staff, Washington, D.C., 19 Dec. 1913, 10. Records of the Office of the Adjutant General, National Archives.

[24] Conklin, *Historical Sketch* 15.

[25] Edward Burr graduated from the U.S. Military Academy at West Point ranked first in the class of 1882. From 26 May 1910 to 25 Sept. 1914 he served in Washington as assistant to the chief engineer, being promoted to colonel on 2 Mar. 1912. Burr was honorably discharged as brigadier general, National Army, on 5 Feb. 1919 and was promoted to brigadier general, Regular Army, in retirement in May 1930. Cullum, *Biographical Register,* Vol. VIA, 330; vol. VIII, 63.

[26] MacArthur, Memorandum, 9, 10.

[27] William Hovgaard, *Modern History of Warships* (Annapolis: United States Naval Institute, 1971) 222–23, 233–36. The Falklands battle took place 8 Dec. 1914, and the battle at Dogger's Bank occurred 24 Jan. 1915.

[28] War Department, *Report of the Board of Review of the War Department* (rpt. Washington: Government Printing Office, 1916) 5.